

REMARKS

The application has been amended and is believed to be in condition for allowance.

Claims 10, 13, and 14-22 are pending.

The remaining claims have been cancelled.

New claims 15 and 22 are based on claims 1-2. Claims 16-21 are based on previously pending claims.

Claim 4 was indicated to be indefinite. In view of claim 4 being cancelled, there are no pending formal matters.

The indicated allowability of claims 1-10 was withdrawn.

Claims 1, 3, 5, 10-12 stand rejected as anticipated by HENDRIKS 4,332,575.

Claims 2, 6-8, and 13-14 stand rejected as obvious over HENDRICKS.

Applicants respectfully disagree and believe the presently pending claims are patentable.

HENDRICKS fairly discloses a driving belt (bands) having a surface (column 1, lines 52-56; column 2, lines 37-38) with a roughness Ra in the range between 0.30 and 0.75 um and preferably between 0.45 and 0.55 um. See column 1, lines 59-62. That surface may be the inner surface as per Figure 2.

As to the purpose of the surface profiling, see column 1, beginning at line 39 and beginning at line 46.

The teaching beginning at line 39 is that "the mutual friction between the bands disposed around each other is decreased, and this appears to have an efficiency increase." Note, the teaching here is to reduce the friction between the nested bands.

The discussion beginning at line 46 concerns the speed difference **between two successive bands**. The disclosed inner surface roughness is taught for reducing friction between bands. See claim 1 "in use there is a mutual speed different (sic) between bands, at least one of said bands, at least at one side, being provided with a **surface profiling which decreases friction between the bands.**"

See also patent claim 6 reciting that at least one band, other than the inner band, has the surface profiling. Thus, it is clear that the teaching is to decrease the friction of surfaces between bands with a surface profile intermediate two bands. Indeed, claim 6 teaches directly away from the inner band having its inner surface be profiled (grooved).

There is no disclosure of the innermost band having its inner side profiled. Therefore, there is no disclosure of "a carrier contacting face of the transverse element and an inner contacting face of the carrier, contacting the carrier contacting face of the transverse element, have a combined roughness Ra' that is more than 0.6 μm " as per original claim 1 and clearly no

disclosure of the inner contact face of the belt contacting the elements having $R_a > 0.8 \mu m$.

Indeed, there are no teachings as to the roughness between these two surfaces.

Thus, the reference neither anticipates nor renders obvious the present invention.

As to the obviousness of original claim 2 (and the new independent claims), which recites "the roughness R_a of the carrier inner contacting face (2) is larger than $0.8 \mu m$ ", this cannot be obvious. Since the carrier inner contacting face (2) is recited in claim 1 as contacting the carrier contacting face of the transverse element, the claim 2 roughness recitation is necessarily for the inner surface of the innermost band. As noted above, HENDRICKS makes no teaching in this requirement and, as per claim 6, teaches directly away from the inner band having its inner surface be profiled (grooved) so that the roughness would be less than that recited.

However, even if the innermost band of HENDRICKS were grooved, the recited roughness of $0.8 \mu m$ is beyond the upper limit disclosed by HENDRICKS.

Indeed, the prior art teaches away from the claimed innermost band inner roughness.

See FUJIOKA et al. 6,629,904 Abstract, teaching directly away from the present invention:

An endless metal belt with reduced friction and increased durability comprises a pair of layered ring structures (31) each formed by superposing a plurality of thin metal rings in layers so as to be slidable relative to each other, and a plurality of metal blocks (32) arranged along the length of the pair of layered ring structures (31) and supported on the pair of layered ring structures (31) so as to be slidable relative to the pair of layered ring structures (31), and the inner circumferences of the thin metal rings excluding the innermost thin metal ring (R1) are provided with oil retaining grooves (34), and the inner circumference in sliding contact with saddle surfaces (32₄) of the metal blocks (32) of the innermost thin metal ring (R1) is a flat, smooth surface (35) not provided with any oil retaining grooves and having a small surface roughness.

FUJIOKA et al. appreciate that increasing surface roughness between the innermost band and the elements also increases friction losses and wear, which actions are contrary to what one of skill in the art would normally seek (i.e., optimizing product efficiency and durability).

Additionally, pages 586 and 587 of the handbook: "Principles and Applications of Tribology" by Bharat Bhushan (attached as an appendix) discloses the common knowledge that as surface roughness Ra increases, the Lubrication number L decrease (see also equation 2 of the application) and the coefficient of friction shows a tendency to increase (see also application Figure 2).

These, individually and in combination, show that the prior art was disposed not to increase roughness between the innermost band inner surface and the elements. Therefore, the claims are believed both novel and non-obvious.

Further, the recited parameters are not merely optimized

values as the art teaches away from increased roughness (at the location specified) and does not appreciate the benefit of the claimed structure.

Lastly, note that the present application concerns improvements that address transmission "rattle", a subject upon which the applied reference is silent. The invention moves in a direction contrary to the prior art teachings and understandings, by applying a relatively high combined roughness in the frictional contact between the innermost surface of the carrier and the elements, which structure comes at the expense of some efficiency loss of the transmission (specification page 2, lines 11-13).

Applicants urge that to find this recited structure obvious is impermissible hindsight.

The new claims are believed allowable for the reasons noted above.

Reconsideration and allowance of all the pending claims are respectfully requested.

Applicants believe that the present application is in condition for allowance and an early indication of the same is respectfully requested.

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The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following items:

- pages 586 and 587 of the handbook: "Principles and Applications of Tribology" by Bharat Bhushan printed by Wiley-Interscience in 1999 (ISBN 0-471-59407-5)